

What is claimed is:

[Claim 1] A method of manufacturing a face-seal interface for a respiratory mask comprising the steps of:

mixing together plasticizing oil, polymer, and at least one additive to form a mixture;
melting the mixture so that the additives are dissolved in a stable solution;
molding or extruding the mixture to form a preselected item;
allowing the preselected item to cool until it solidifies and becomes an elastomer;
whereby the at least one additive precipitates after the solidification of the elastomer;
and
whereby the at least one additive migrates to the surface of the elastomer to form a dry powder that covers the surface of the face-seal interface and provides a lubricant .

[Claim 2] The method of claim 1, wherein the amount of the at least one additive is proportionally in excess of an amount of additive that is soluble in the elastomer at room temperature.

[Claim 3] The method of claim 1, wherein the at least one additive is added to the mixture of polymer and plasticizing oil in when the mixture is in its molten state.

[Claim 4] The method of claim 1, further comprising the step of stretching the elastomer after the elastomer has solidified.

[Claim 5] The method of claim 1, further comprising the step of mixing a seed oil with an insoluble fine powder to the plasticizing oil.

[Claim 6] The method of claim 1, further comprising the step of posting a precipitation seed on the molded elastomer.

[Claim 7] The method of claim 1, further comprising the step of selecting the at least one additive from a group consisting of Tetrakis (2,4-di-tert-butylphenyl) [1,1-biphenyl]-4,4'-diylbisphosphonite; Tris (2,4-ditert-butylphenyl) phosphate; Butanedioic acid, dimethylester, polymer with 4-hydroxy-2,2,6,6-tetramethyl-1-piperidine ethanol; 2,6-di-tert-butyl-4-(4,6-bis(octylthio)-1,3,5-triazin-2-ylamino) phenol; 3,3',3',5,5',5'-hexa-tert-butyl-a,a',a'-(mesitylene-2,4,6-triyl) tri-p-cresol; and Pentaerythritol Tetrakis (3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionate).

[Claim 8] The method of claim 1, further comprising the step of selecting the polymer from a group consisting of poly (styrene ethylene ethylene propylene styrene), poly (styrene ethylene butylene styrene), and poly (styrene ethylene propylene styrene).

[Claim 9] The method of claim 1 further comprising the step of molding the elastomer face-seal interface into a lip seal configuration.

[Claim 10] The method of claim 1 further comprising the step of molding the elastomer face-seal interface into a gel-filled bladder.

[Claim 11] The method of claim 1 further comprising the step of molding the elastomer face-seal interface into a particle-filled bladder.

[Claim 12] The method of claim 11 further comprising the step of filling the bladder with particles under negative pressure whereby the bladder conforms to a face when forced on the face yet retains the shape even if the mask is removed.

[Claim 13] The method of claim 11 further comprising the step of filling the bladder with particles and fluid in combination.

[Claim 14] The method of claim 13 wherein the step of filling the bladder with particles and fluid in combination is performed substantially at atmospheric pressure.

[Claim 15] The method of claim 13 wherein the fluid is selected from the group consisting of water and silicone oil.

[Claim 16] A method of manufacturing an elastomer for a face-seal interface for a respiratory mask comprising the steps of:

mixing together a mineral oil, a polymer, and a predetermined amount of additive to form a mixture;

the predetermined amount of additive being proportionally in excess of an amount of additive that is soluble in the mixture at room temperature;

increasing the temperature of the mixture to a melting point where the additive becomes soluble in the molten mixture in a stable solution;

molding or extruding the mixture;

allowing the molded mixture to cool to form an elastomer;

whereby the additive precipitates from the elastomer and migrates to the surface of the elastomer in the form of a dry powder as the elastomer solidifies.

[Claim 17] The product of the method of claim 16.

[Claim 18] The product of claim 17, wherein the additive is selected from a group consisting of Tetrakis (2,4-di-tert-butylphenyl) [1,1-biphenyl]-4,4'-diylbisphosphonite; Tris (2,4-ditert-butylphenyl) phosphate; Butanedioic acid, dimethylester, polymer with 4-hydroxy-2,2,6,6-tetramethyl-1-piperidine ethanol; 2,6-di-tert-butyl-4-(4,6-bis(octylthio)-1,3,5-triazin-2-ylamino) phenol; 3,3',3',5,5',5'-hexa-tert-butyl-a,a',a'-(mesitylene-2,4,6-triyl) tri-p-cresol; and Pentaerythritol Tetrakis (3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionate).

[Claim 19] The product of claim 17, wherein the polymer is selected from a group consisting of poly (styrene ethylene ethylene propylene styrene), poly (styrene ethylene butylenes styrene), and poly (styrene ethylene propylene styrene).

[Claim 20] The method of claim 16 further comprising the step of molding the elastomer face-seal interface into a lip seal configuration.

[Claim 21] The method of claim 16 further comprising the step of molding the elastomer face-seal interface into a gel-filled bladder.

[Claim 22] The method of claim 16 further comprising the step of molding the elastomer face-seal interface into a particle-filled bladder.

[Claim 23] The method of claim 22 further comprising the step of filling the bladder with particles under negative pressure whereby the bladder conforms to a face when forced on the face yet retains the shape even if the mask is removed.

[Claim 24] The method of claim 22 further comprising the step of filling the bladder with particles and fluid in combination.

[Claim 25] The method of claim 24 wherein the step of filling the bladder with particles and fluid in combination is performed substantially at atmospheric pressure.

[Claim 26] The method of claim 24 wherein the fluid is selected from the group consisting of water and silicone oil.

[Claim 27] A face-seal interface for a respiratory mask comprising a particle-filled elastomeric bladder.

[Claim 28] The face-seal interface of claim 27 wherein the elastomeric bladder is vacuum-packed with the particles.

[Claim 29] The face-seal interface of claim 27 wherein the interstitial space between particles within the elastomeric bladder is filled with fluid.

[Claim 30] The face-seal interface of claim 29 wherein the fluid is selected from the group consisting of water and silicone oil.